

Populational Performance: Unit of Effectiveness / Per capita Cancer Cost

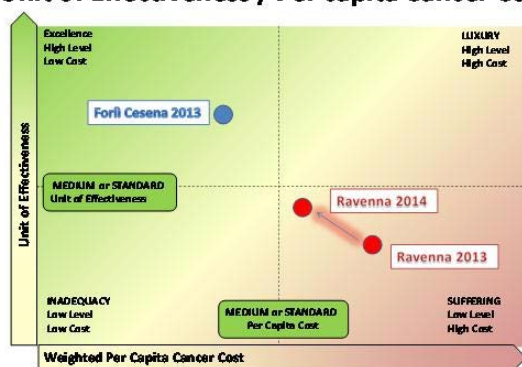


Fig.2 Indicator results

Indicators	2013 Ravenna	2014 Ravenna	2013 Forlì Cesena
Waiting times for treatments (Performance Index to 30 days)	35%	76.9%	31%
% Advanced treatment (V-MAT - IM RT)	23%	48%	53%
Passive migration to other areas	55%	41%	14%
Average access to treatment	19	15	14

Conclusion: Investments in technological upgrades in public services can result in increased efficiency and productivity levels, while improving service quality, decreasing costs and reducing service duplication and overlapping. Our preliminary findings suggest the applicability of our model to the full cancer care pathway

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Could a 3-tier teleradiotherapy network provide a cost-effective radiotherapy care in LMICs?

N.R. Datta¹, M. Heuser¹, M. Samiei², S. Bodis¹

¹Kantonsspital Aarau, Radio-Onkologie, Aarau, Switzerland

²International Atomic Energy Agency IAEA, Senior Consultant, Vienna, Austria

Purpose or Objective: Information and communication technologies (ICTs) have enabled cost-effective eHealth programmes gain wider acceptance in a range of health disciplines. However, this is yet to be evaluated in radiotherapy (RT), especially in low- and middle income countries (LMICs). We explored the use of ICTs to create a 3-tier network of teleradiotherapy centres (RTC), namely - primary (PRTC) with 1 teletherapy (TRT) unit; secondary (SRTC) with 2 TRT units and brachytherapy (BRT); and tertiary RT centre (TRTC) with state-of-the-art RT facilities. The cost-effectiveness of this network was evaluated for 10 adjoining countries in middle and east Africa.

Material and Methods: Seven of the 10 countries (Gabon, Congo Republic, Congo DR, Central African Republic, South Sudan, Rwanda and Burundi) have no RT facilities for their 123.6 million inhabitants. Remaining 3 countries (Uganda, Kenya and Tanzania) have in total 11 TRT and 6 BRT units. Thus, presently, only 2.3% of 262.2 million people have RT access in these 10 countries. Based on the regional population density and location of current centres, 6 PRTCs, 2 upgraded PRTCs (with BRT), 6 SRTCs and upgradation of an existing centre to SRTC are proposed. These could be networked to share the available resources. With DICOM RT compatible data sets, ICTs could facilitate an easy exchange of patient information between centres. Consequently, patients at PRTC with a standalone TRT unit could deliver RT based on treatment plans derived at SRTC. Similarly patients treated at PRTC could receive brachytherapy at SRTC. TRTC could cater to specialized RT techniques not feasible either at PRTC or SRTC. Thus, patients within the 3-tier network would have access to state-of-the-art technology in a shared step-wise manner.

Results: The total cost of the infrastructure, networking, maintenance and incidentals is estimated around US\$ 66.25

million. With a total of 32 TRT and 15 BRT units provided in this network, the RT accessibility would enhance from 2.3% to 30.7% (9.2%-76.9%). The mean cost of this investment for the 262.2 million inhabitants would be around US\$ 0.69 per inhabitant (US\$ 0.12-2.22) while the average cost in terms of individual patients receiving RT is estimated to be US\$ 374 (US\$ 71.67-508.33). Capacity building could be undertaken through telementoring by linking to regional or international centres of excellence and professional societies through multisectoral collaborative efforts.

Conclusion: The 3 tier-teletherapy network with ICTs could provide cost-effective comprehensive RT care by overcoming the geographical barriers by optimizing resource sharing, pedagogical telementoring and capacity building. This could lead to scalable, equitable, affordable and improved RT access to patients of the region. The approach could be explored for other underserved LMICs and executed with the help of respective national and international stakeholders.

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Abstract withdrawn

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Predicted patient demand for MRI Linac

B. Sanderson¹, A. McWilliam², C. Faivre-Finn¹, A. Choudhury¹, T. Mee³

¹The Christie NHS Foundation Trust, Department of Clinical Oncology, Manchester, United Kingdom

²The Christie NHS Foundation Trust, Department of Medical Physics and Engineering, Manchester, United Kingdom

³University of Manchester, Institute of Cancer Sciences, Manchester, United Kingdom

Purpose or Objective: MRI offers superior soft tissue delineation compared to CT. When incorporated in to a linear accelerator (MRI Linac), it could improve temporal resolution and dynamic visualisation of the target during treatment allowing for motion compensation and real-time adaptive planning. This study investigated the predicted patient demand for radiotherapy delivered via a MRI Linac for prostate and lung cancer at a large comprehensive cancer centre to ensure that any clinical research will be achievable.

Material and Methods: Local stage data was sourced from hospital databases and the UK NHS CASCADE system. Indications for MRI Linac were obtained by consulting with the specialist clinical leads for prostate and lung cancers. Locally advanced patients where soft tissue definition would be clinically advantageous were identified (T3/4 prostate, stage 2/3 non-small cell lung cancer [NSCLC] including superior sulcus tumours and limited stage small cell lung cancer [SCLC] with good performance status). The Malthus programme was used to estimate the demand for MRI Linac. The Malthus programme is an evidence based, predictive mathematical model, based on regional population and incidence data, mapping around 2,000 clinical decisions relating to radiotherapy for 23 different cancer sites.

Results: The catchment area of the comprehensive cancer centre in the study is approximately 3.2 million people. For prostate, the total projected incidence for 2015 was 1,983 cases, of which 436 high risk patients were predicted to be eligible for MRI Linac. For lung, the total projected incidence for 2015 is 2,634 cases. Of these, a total of 360 patients were identified as suitable for MRI Linac (table 1). Approximately 92 of the NSCLC's were considered superior sulcus tumours.